6-3 Assignment: Interpreting UML Diagrams

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CS-255: Systems Analysis and Design

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October 12th,2024

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# Diagram Interpretation

1. Use Case: The use case described by these diagrams is an ATM withdrawal transaction where the user enters their card, provides a PIN for verification, requests a withdrawal amount, and receives cash if the amount is available.

2. Interactions and Information Flow:  
 - In the UML Activity Diagram, the user first enters their PIN, which is verified. If the PIN is incorrect, the transaction terminates. If correct, the user is asked for the withdrawal amount. If the requested amount is available, the ATM dispenses cash, generates a receipt, and ends the transaction.  
 - In the UML Sequence Diagram, the user interacts with both the ATM and the bank. After the user enters the card and PIN, the ATM sends the PIN to the bank for verification. Once verified, the user requests the withdrawal amount, and the ATM dispenses the cash.

# Design Analysis - Identified Deficiencies

## 1. Error Handling for PIN Entry:

Deficiency: The current activity diagram only handles one attempt for entering the PIN. In real-world systems, users are usually given multiple attempts to enter the correct PIN before the transaction is terminated.

Improvement: Add a loop to allow users multiple attempts (e.g., 3 tries) to enter the correct PIN before terminating the process.

## 2. Insufficient Funds Scenario:

Deficiency: The current diagrams do not consider what happens if the user requests more money than they have available in their account.

Improvement: Add logic to handle insufficient funds by notifying the user and allowing them to retry with a different amount or cancel the transaction if the user decides not to proceed.

# Improved UML Activity Diagram

Based on the identified deficiencies, I have reconstructed the UML Activity Diagram to address the first deficiency regarding multiple PIN entry attempts. The updated diagram incorporates a loop that allows users to retry their PIN up to 3 times before the transaction is terminated. This change improves the logic and error handling in the ATM transaction process.

See the attached updated UML Activity Diagram below:

<https://lucid.app/lucidchart/a0d3cf62-b708-4518-b6f9-62f22f0c0a71/edit?from_internal=true>